

WHAT IS CLAIMED IS:

1. A wiring structure comprising:
  - a first inter-layer dielectric formed on a substrate and having a contact hole, said first inter-layer dielectric being composed of a porous film having a relatively low porosity;
  - a second inter-layer dielectric formed on said first inter-layer dielectric and having a wire groove, said second inter-layer dielectric being composed of a porous film having a relatively high porosity;
  - a contact composed of a metal film filled in said contact hole; and
  - a metal wire composed of a metal film filled in said wire groove.
2. The structure of claim 1, wherein the porous film is formed by performing a plasma process using a plasma derived from a gas containing a reducing gas with respect to an organic-inorganic hybrid film,
3. The structure of claim 2, wherein the organic-inorganic hybrid film is deposited by plasma enhanced CVD using a gas mixture of a silicon alkoxide and an organic compound as a reactive gas.
4. The structure of claim 3, wherein the silicon alkoxide is an organic silicon alkoxide represented by the general formula:  $R^1Si(OR^2)_3$  where  $R^1$  and  $R^2$  are the same or different, each representing an alkyl group or an aryl group.
5. The structure of claim 3, wherein the reducing gas contains a hydrogen gas or an ammonia gas.
6. The structure of claim 2, wherein the organic-inorganic hybrid film has a siloxane skeleton.
7. The structure of claim 6, wherein the reducing gas contains a nitrogen atom.

8. The structure of claim 7, wherein the reducing gas contains an ammonia gas.
9. The structure of claim 6, wherein the reducing gas contains a hydrogen atom.
10. The structure of claim 9, wherein the reducing gas contains a hydrogen gas or an ammonia gas.
11. The structure of claim 1, wherein the porous film is formed by performing a thermal treatment in an atmosphere containing a reducing gas with respect to the organic-inorganic hybrid film.
12. The structure of claim 11, wherein the organic-inorganic hybrid film is deposited by plasma enhanced CVD using a gas mixture of a silicon alkoxide and an organic compound as a reactive gas.
13. The structure of claim 12, wherein the silicon alkoxide is an organic silicon alkoxide represented by the general formula:  $R^1Si(OR^2)_3$  where  $R^1$  and  $R^2$  are the same or different, each representing an alkyl group or an aryl group.
14. The structure of claim 12, wherein the reducing gas contains a hydrogen gas or an ammonia gas.